

Translation

PATENT COOPERATION TREATY



PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

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| Applicant's or agent's file reference PCT/EPA 334 | FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) | |
| International application No. PCT/EP2003/003775 | International filing date (day/month/year) 11 April 2003 (11.04.2003) | Priority date (day/month/year) 11 April 2002 (11.04.2002) |
| International Patent Classification (IPC) or national classification and IPC G03F 7/20 | | |
| Applicant HEIDELBERG INSTRUMENTS MIKROTECHNIK GMBH | | |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.

This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:

- I Basis of the report
- II Priority
- III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV Lack of unity of invention
- V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI Certain documents cited
- VII Certain defects in the international application
- VIII Certain observations on the international application

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|---|--|
| Date of submission of the demand 05 November 2003 (05.11.2003) | Date of completion of this report 17 August 2004 (17.08.2004) |
| Name and mailing address of the IPEA/EP | Authorized officer |
| Facsimile No. | Telephone No. |

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP2003/003775

I. Basis of the report

1. With regard to the elements of the international application:*

the international application as originally filed

the description:
pages _____ 1-20 _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

the claims:
pages _____, as originally filed
pages _____, as amended (together with any statement under Article 19) _____, filed with the demand
pages _____, filed with the letter of _____ 05 May 2004 (05.05.2004)

the drawings:
pages _____ 1/6-6/6 _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

the sequence listing part of the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
 the language of publication of the international application (under Rule 48.3(b)).
 the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

contained in the international application in written form.
 filed together with the international application in computer readable form.
 furnished subsequently to this Authority in written form.
 furnished subsequently to this Authority in computer readable form.
 The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
 The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

the description, pages _____
 the claims, Nos. _____
 the drawings, sheets/fig. _____

5. This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP 03/03775

I. Basis of the report

1. This report has been drawn on the basis of (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

This report makes reference to the following documents:

D1 US 5 625 436 A

D2 EP 1 037 266 A.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP 03/03775

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | | |
|-------------------------------|--------|------|-----|
| Novelty (N) | Claims | 1-18 | YES |
| | Claims | | NO |
| Inventive step (IS) | Claims | 1-18 | YES |
| | Claims | | NO |
| Industrial applicability (IA) | Claims | 1-18 | YES |
| | Claims | | NO |

2. Citations and explanations

The establishment of a statement with respect to novelty and inventive step has been rendered unnecessarily difficult because

- (1) the claims lack clarity within the meaning of PCT Article 6, and
- (2) the independent claims have not been drafted in the two-part form defined by PCT Rule 6.3(b).

The claims lack clarity because the term "illumination spot" is not used consistently.

According to page 6, lines 19 and 20 of the description, the illumination spot is an *illuminated area*, and a *plurality of (possibly sequentially illuminated)* illumination spots is an *essential feature* of the invention; cf. also description, page 7, last line to page 8, line 17.

According to subclaims 16 and 17, the illumination spot is an *area which is illuminated at a specific point in time*, and a *plurality of illumination spots* is an *optional feature* of the invention; cf. also the last two paragraphs of the description and figures 7 and 8.

For the purposes of this preliminary examination, the term "illumination spot" shall be interpreted according to page 6, lines 19 and 20 of the description as an illuminated area among a plurality of (possibly sequentially) illuminated areas.

The generation of a plurality of illumination spots as claimed in subclaims 16 and 17 shall be interpreted as the simultaneous generation of a plurality of illumination spots.

The **claims** are novel and inventive within the meaning of PCT Article 33.

D1 is regarded as the prior art closest to the subject matter of claim 1. D1 discloses (see the passages cited in the search report) the preamble of claim 1, namely a:

method for projecting a mask (2) on a substrate (5), the mask (2) being projected on the substrate (5) by means of an illuminating unit (1a-1e) and an optical unit (3a-3e, 4a-4e),

characterized in that the illuminating unit (1a-1e) and the optical unit (3a-3e, 4a-4e) are displaced relative to the mask (2) and to the substrate (5) (cf. column 6, lines 50-55),

in that deformations of the substrate (5) are detected (cf. column 8, lines 29-46), and in that the projection of the mask is distorted and adapted to the deformations of the substrate (5) as a function of the deformations detected by means of the optical unit (3a-3e, 4a-4e) (cf. column 8, lines 47-65) illumination spots (M1-M5) being*

generated on the mask (2) and, furthermore, individual projections (P1-P5), the edge areas of which overlap, being generated on the substrate (5); cf. figure 1.

* = illuminated areas - cf. the observation with respect to clarity above.

D1 also discloses a displacement of the overlapping individual projections, on the substrate, of the illuminated spots (illuminated areas of the mask) as a function of substrate deformations. Therefore, claim 1 has not been drafted in the requisite two-part form.

The **difference** between claim 1 and D1 is that the illuminated spots (illuminated areas of the mask) overlap and are less intense in the edge area.

Therefore, the displacement of the overlapping individual projections is a displacement of overlapping individual projections of the overlapping illumination spots.

The **problem** to be solved by this difference is that of providing a simple method for compensating for the substrate deformations, neither a plurality of illumination systems nor a plurality of projection lenses being necessary therefor.

None of the available documents discloses this difference.

D2 (paragraphs 13, 14, 115, and 215) discloses only the displacement of non-overlapping individual projections as a function of substrate deformations.

Furthermore, it is noted that D1 aims to achieve as perfect a projection as possible. The difference mentioned

above would, in D1, lead to an undesired decrease in image quality, because precise regulation of the progression of intensity in the edge area of the illumination spot either would not be possible or would be possible only with considerable outlay.

Therefore, **claim 1** meets the requirements of PCT Article 33.

Claims 2-8 likewise meet the requirements of PCT Article 33, because they are dependent on claim 1.

The argument in support of independent method claim 1 applies, *mutatis mutandis*, to the corresponding independent **device claim 9**. Therefore, claim 9 meets the requirements of PCT Article 33.

Claims 10-18 likewise meet the requirements of PCT Article 33, because they are dependent on claim 9.